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NOTES ON THE GRASSES OF HOWELL'S FLORA OF NORTHWEST AMERICA

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Every student who makes a serious attempt to become familiar with the flora of Washington or Oregon, must acknowledge his obligation to the great work of Thomas Howell. The adjective is used advisedly. When we take into account the author's lack of scientific training, the very limited herbarium and library resources at his command, the scarcity of congenial associates, and the constant financial burdens under which he labored, and then observe the total of species and forms which he was able to recognize, the number of new species which he published, the keenness of his observation and the soundness of his critical judgment, we can hardly avoid the conclusion that here was a scientist who with better preparation and under a more favorable environment would have been worthy of rank with John Torrey or Asa Gray. With all its inevitable defects, his Flora must remain a land-mark in the history of Western botany, and the essential soundness of his fundamental conclusions is being vindicated daily. Nor do we detract in any way from the value of his work, or cast any aspersion on his scientific conscience, when we venture to point out that the Flora has from the beginning been in need of revision, and has in many respects become almost obsolete since its publication in 1893. Howell himself, had he lived, would have taken full account of the advances in botanical knowledge, and would have been the first to suggest a revision of his Flora.

In the course of an attempt to become familiar with the grasses of Oregon, particularly of that part of the state included in the

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Willamette Valley, the present writer has found it necessary to make the following notes on the Gramineae (pp. 713–781) in his interleaved copy of Howell's Flora:

I. Species Not Included which have Since been found in Various Localities in Oregon

1. *Paspalum dilatatum* Poir. On ballast at Linnton.
2. *Panicum barbinode* Trin. With the last.
3. *Panicum pacificum* Hitchc. & Chase. On gravelly prairies and along streams throughout the Willamette Valley.
4. *Panicum thermale* Boland. On rocky shore of Rogue River near Agness, Curry County.
5. *Panicum miliaceum* L. On rubbish-heaps about Salem.
6. *Digitaria humifusa* Pers. On sand-bars in the Willamette River, and beginning to appear on lawns in Salem.
7. *Phalaris minor* Retz. On ballast at Linnton.
8. *Phalaris paradoxa* L. var. *praemorsa* Coss. & Dur. With the last.
9. *Phalaris brachystachys* Link. With the last.
10. *Cenchrus carolinianus* Walt. With the last.
11. *Setaria imberbis* Poir. With the last.
12. *Anthoxanthum Puelii* Lecoq & Lamotte. Not uncommon in dry, especially alkaline, soil throughout the Willamette Valley.
13. *Agrostis pallens* Trin. On sand-dunes along the coast.
14. *Agrostis alba* L. var. *maritima* (Lam.) Mey. Common on sand-dunes and in salt-marshes along the coast.
15. *Cynodon Dactylon* L. On ballast at Linnton, and beginning to appear in cultivated ground about Eugene.
16. *Ammophila arenaria* (L.) Link. On ballast at Linnton.
17. *Apera spica-venti* (L.) Beauv. On a lawn at Salem.
18. *Nassella chilensis* Desv. On ballast at Linnton.
19. *Eleusine tristachya* Kunth. With the last.
20. *Chloris radiata* Sw. With the last.
21. *Stipa littoralis* Phil. With the last.
22. *Stipa Lemmoni* Scribn. var. *Jonesii* Scribn. On dry slopes in southwestern Oregon.

23. *Lepturus incurvatus* Trin. On ballast, Linnton.
24. *Aira capillaris* Host. On sand-bars along the Santiam River, and in cultivated ground at Salem.
25. *Deschampsia holciformis* (Presl) Steud. On dry soil at summit of ocean bluffs on Yaquina Head.
26. *Avena barbata* Brot. Becoming common along the railroad near Salem.
27. *Eragrostis cyperoides* (Thunb.) Beauv. On ballast at Linnton.
28. *Eragrostis Orcuttiana* Vasey. With the last.
29. *Panicularia occidentalis* Piper. Common in ditches in the region about Salem.
30. *Cynosurus cristatus* L. Occasional on lawns at Salem and Eugene. *C. echinatus* L. is reported by Mr. V. R. Bradshaw as spreading rapidly in the vicinity of Eugene.
31. *Poa trivialis* L. Not uncommon in shady places throughout.
32. *Poa alcea* Piper. In rocky woods at Elk Rock, Multnomah County.
33. *Puccinellia paupercula* (Holm) Fern. & Weath. var. *alaskana* (Scribn. & Merr.) Fern. & Weath. Not infrequent in salt-marshes and on sea-beaches along the coast.
34. *Festuca megalura* Nutt. Abundant in dry soil almost everywhere.
35. *Festuca bromoides* L. Common in cultivated ground and along railroads.
36. *Festuca rubra* L. var. *megastachys* Gaudin. Occasional on roadsides.
37. *Scleropoa rigida* Griseb. Around old buildings in the business district of Salem.
38. *Lolium multiflorum* Lam. Abundant in waste and cultivated ground everywhere.
39. *Lolium perenne* L. var. *cristatum* Doell. A single specimen in a wooded ravine near Eola, Polk County.
40. *Agropyron caesium* Presl. Dry soil about light-house on Yaquina Head.
41. *Agropyron junceum* Beauv. On ballast at Linnton.
42. *Agropyron glaucum* R. &. S. With the last.
43. *Agropyron pungens* (Pers.) R. & S. With the last.

II. Species Whose existence in the Territory Does Not Seem to be Confirmed

1. *Panicum capillare* L. Although some of the Oregon forms seem to approach this species, it seems best to refer them to *P. barbipulvinatum* Nash.
2. *Panicum pubescens* Lam.
3. *Panicum dichotomum* L. Both of these seem referable to *P. occidentale* Scribn.
4. *Panicum scoparium* Lam. Evidently *P. Scribnerianum* Nash.
5. *Aristida fasciculata* Torr. Probably *A. bromoides* HBK., and its occurrence very doubtful.
6. *Melica interrupta* Trin. The name seems to be incorrectly applied.
7. *Panicularia fluitans* Kuntze. Probably *P. leptostachya* (Buckl.) Piper.
8. *Poa glauca* Vahl. An introduced species—not confirmed by any later collector.
9. *Festuca heterophylla* Lam. Probably *F. occidentalis* Hook.
10. *Elymus dasystachys* Trin. Apparently not correctly applied.

III. Species whose Taxonomic Limits are now Generally Understood Differently

1. *Panicum sanguinale* L. = *Digitaria sanguinalis* (L.) Scop.
2. *Panicum crus-galli* L. = *Echinochloa crus-galli* (L.) Beauv.
3. *Phalaris amethystina* Trin. = *P. californica* Hook. & Arn.
4. *Sporobolus cuspidatus* Wood = *S. Richardsonii* (Trin.) Merr.
5. *Sporobolus depauperatus* Scribn. = *Muhlenbergia squarrosa* Rydb.
6. *Sporobolus Bolanderi* Vasey = *Poa multnomae* Piper.
7. *Sporobolus gracillimus* Vasey = *Muhlenbergia filiformis* Rydb.
8. *Sporobolus simplex* Scribn. = *Muhlenbergia filiformis* Rydb.
9. *Sporobolus filiformis* Scribn. = *Muhlenbergia filiformis* Rydb.
10. *Agrostis asperifolia* Trin. = *A. exarata* Trin.

11. *Agrostis grandis* Trin. = *A. exarata* Trin.
12. *Agrostis Scouleri* Trin. = *A. exarata* Trin.
13. *Agrostis densiflora* Vasey = *A. glomerata* (Presl) Kunth.
14. *Agrostis verticillata* Vill. = *A. stolonifera* L.
15. *Agrostis tenuiculmis* Nash = *A. idahoensis* Nash.
16. *Agrostis Pringlei* Scribn. = *A. Hallii* Vasey var. *Pringlei* (Scribn.) Hitchc.
17. *Agrostis geminata* Trin. = *A. hyemalis* (Walt.) BSP. var. *geminata* (Trin.) Hitchc.
18. *Agrostis attenuata* Vasey. = *A. oregonensis* Vasey.
19. *Agrostis scabra* Willd. = *A. hyemalis* (Walt.) BSP.
20. *Agrostis varians* Trin. = *A. Rossae* Vasey.
21. *Agrostis virescens* HBK. Probably = *A. ampla* Hitchc.
22. *Gastridium australe* Beauv. = *G. lendigerum* (L.) Gaudin.
23. *Cinna pendula* Trin. = *C. latifolia* (Trev.) *Griseb.*
24. *Calamagrostis lactea* Beal = *C. Langsdorfii* Trin. var. *lactea* (Beal) Kearn.
25. *Spartina cynosuroides* Willd. = *S. Michauxiana* Hitchc.
26. *Stipa Kingii* Boland. = *Oryzopsis Kingii* (Boland.) Beal.
27. *Stipa Bloomeri* Boland. = *Oryzopsis Bloomeri* (Boland.) Ricker.
28. *Stipa oregonensis* Scribn. = *S. occidentalis* Scribn.
29. *Stipa viridua* Trin. = *S. minor* Scribn.
30. *Oryzopsis cuspidata* Vasey = *O. hymenoides* (R. & S.) Ricker.
31. *Alopecurus geniculatus* L. var. *robustus* Vasey = *A. geniculatus* L.
32. *Alopecurus pallescens* Piper = *A. californicus* Vasey.
33. *Avena fatua* L. var. *glabrescens* Coss. = var. *glabrata* Peterm.
*34. *Avena Smithii* Porter = *Melica Smithii* (Porter) Vasey.
35. *Trisetum barbatum* Steud. = *Bromus Trinii* Desv.
36. *Trisetum subspicatum* Beauv. = *T. spicatum* (L.) Richter.
37. *Deschampsia calycina* Presl = *D. danthonioides* (Trin.) Munro.

*Farwell has recently established the genus *Bromelica* for this section of *Melica* (Rhodora 21: 76–78).

38. *Holcus lanatus* L. = *Notholcus lanatus* (L.) Nash.
39. *Eatonia obtusata* Gray = *Sphenopholis obtusata* (Michx.) Scribn.
40. *Eatonia pennsylvanica* Gray = *Sphenopholis pallens* (Spreng.) Scribn.
41. *Melica bulbosa* Geyer = *M. bella* Piper.
*42. *Melica bromoides* Gray and var. *Howellii* Scribn. = *M. Geyeri* Munro.
*43. *Melica Harfordii* Boland. var. *minor* Vasey = subsp. *tenuior* Piper.
*44. *Melica acuminata* Boland. = *M. subulata* (Griseb.) Scribn.
45. *Melica scabrata* Scribn. = *M. spectabilis* Scribn.
46. *Distichlis maritima* Raf. = *D. spicata* (L.) Greene.
47. *Panicularia nervata* Kuntze = *Glyceria elata* Hitchc.
48. *Poa reflexa* Vasey & Scribn. = *P. leptocoma* Trin.
49. *Poa incurva* Scribn. & Williams = *P. Sandbergii* Vasey.
50. *Poa occidentalis* Vasey & Scribn. = *P. nervosa* (Hook.) Vasey.
51. *Poa purpurascens* Vasey = *P. paddensis* Williams.
52. *Poa flava* L. = *P. triflora* Gilib.
53. *Poa invaginata* Scribn. & Williams = *P. gracillima* Vasey.
54. *Poa Buckleyana* Nash and var. *stenophylla* Vasey = *P. scabrella* Benth.
55. *Eragrostis reptans* Nees = *E. hypnoides* (Lam.) BSP.
56. *Festuca microstachys* Nutt. var. *ciliata* Gray = *F. Grayi* (Abrams) Piper.
57. *Festuca microstachys* Nutt. var. *pauciflora* Scribn. & Vasey = *F. reflexa* Buckl.
58. *Festuca denticulata* Beal = *F. subuliflora* Scribn.
59. *Festuca californica* Vasey = *F. aristulata* (Torr.) Shear.
60. *Festuca Jonesii* Vasey = *F. subulata* Trin.
61. *Festuca brevifolia* R. Br. = *F. ovina* L. var. *brachyphylla* (Schultes) Piper.
62. *Festuca ovina* L. var. *polyphylla* Vasey = *F. occidentalis* Hook.
63. *Festuca ovina* L. var. *ingrata* Hack. = *F. idahoensis* Elmer.
64. " " " " *columbiana* Beal = *F. idahoensis* Elmer.

* See note on no. 34 above.

65. *Festuca ovina* L. var. *oregana* Hack. = *F. idahoensis* Elmer.
66. *Festuca scabrella* Torr. = *F. altaica* Trin.
76. *Festuca rubra* L. var. *pubescens* Vasey = var. *Kitaibeliana* (Schultes) Piper.
68. *Festuca rubra* L. var. *littoralis* Vasey = var. *pruinosa* Hack.
69. *Bromus racemosus* L. var. *commutatus* Hook. = *B. commutatus* Schrad.
70. *Bromus hordeaceus* L. var. *glabrescens* Shear = var. *leptostachys* Beck.
71. *Bromus Gussoni* Parl. = *B. villosus* Forsk. and prob. var. *Gussonei* Aschers. & Graebn.
72. *Agropyron divergens* Nees = *A. spicatum* (Pursh) Scribn. & Sm.
73. *Agropyron brevifolium* Scribn. = *A. violaceum* Vasey.
74. *Agropyron Elmeri* Scribn. = *A. lanceolatum* Scribn. & Sm.
75. *Agropyron dasystachyum* [(Hook.) Scribn.] var. *subvillosum* Scribn. & Sm. = *A. subvillosum* (Hook.) Piper.
76. *Hordeum maritimum* With. = *H. geniculatum* All.
77. *Elymus saxicolus* Scribn. & Sm. = *Agropyron flexuosum* (Piper) Piper.
78. *Elymus mollis* Trin. = *E. arenarius* L.
79. *Elymus littoralis* Turcz. = *E. arenicola* Scribn. & Sm.
80. *Sitanion elymoides* Raf. Prob. = *S. Hystrix* (Nutt.) Sm.
81. *Sitanion glaber* J. G. Smith = *S. rigidum* Sm.
82. *Sitanion villosum* J. G. Smith = *S. jubatum* Sm.
83. *Sitanion Leckenbyi* Piper = *S. planifolium* Sm.
84. *Sitanion flexuosum* Piper = *Agropyron flexuosum* (Piper) Piper.
85. *Sitanion Brodiei* Piper = *Elymus canadensis* L.

To assert that all the above changes are accepted as universally valid is simply to assume the existence of a nomenclatorial tribunal whose decisions are everywhere accepted as final. Since a species is not an objective entity but a subjective concept, its limitations must in the end remain a matter of private judgment. Doubtless some modern agrostologists would retain many of Howell's names: but it is believed that the changes suggested above approximate the present consensus of opinion regarding specific limitations.